

REMARKS / ARGUMENTS

With this Amendment, claims 11 – 37 remain in this application. Claims 1 – 10 have been cancelled. Claims 11 – 27 have been previously presented.

Claims 28 – 37 are new. Support for these new claims may be found in the Specification on page 5, lines 1 through 15.

Claim Rejections Under 35 U.S.C. § 103:

Claims 11 – 13 and 17 – 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kelkar et al '833 in view of Fein '898. Applicants respectfully submit that the present invention is not unpatentable over Kelkar et al '833 in view of Fein '898.

Kelkar et al. '833 discloses a torch wherein the primary gas (i.e. plasma gas) commingles with the secondary gas (i.e. shielding gas). The principle effect is to have a secondary gas path flow that contains an admixture of primary and secondary gases. In fact, Kelkar et al. '833 discloses that nitrogen or argon, among other gases, may be simultaneously used for *both* primary and secondary gases.

Kelkar et al. '833 also discloses a preference for oxygen as the primary gas, but notes that other gases (such as air, nitrogen, argon or an argon/hydrogen mixture) may also be used. These are all plasma gases that are well known to the skilled artisan.

Kelkar et al. '833 notes among the advantages of this disclosure, that “an oxygen rich secondary gas mixture has been found to positively impact the quality (e.g. surface finish, bevel angle, dross) of the cut made by the torch.” (Page 4, paragraph 29)

Kelkar et al. '833 discloses a torch that is designed in such a way that the secondary gas exits the nozzle nearly parallel to the primary gas, and only intersects with the primary gas at a point near the kerf.

- It is stated that the secondary openings of the shield cap are radially spaced “to direct gas exhausted from the torch through the secondary opening s onto the kerf region of the cut made by the plasma arc in the workpiece.” (Page 3, paragraph 20)

- It is stated that the tip is designed in order to "seal gas in the secondary gas chamber against flowing to the plasma arc as plasma exits the tip orifice." (Page 3, paragraph 23)
- And it is stated that "it will be seen that several objects of the invention are achieved and other advantageous results obtained. Sealing off the flow of the secondary gas mixture against impinging on the plasma arc as plasma exits the tip improves plasma arc stability and also improves the surface finish, dress characteristics and bevel angle of the cut." (Page 4, paragraph 29)

Therefore, in sharp contrast to the present invention, Kelkar et al. '833 discloses the use of oxidizing plasma and shielding gases, a nozzle design in which these two gases are commingled, and a nozzle design in which the two exiting gas streams do not converge until well beyond the nozzle tip itself.

On the other hand Fein '898 discloses a plasma arc torch that introduces water near the base. This water disassociates into hydrogen and oxygen at the extremely high temperatures in the plasma jet, and then recombines to form water in the vicinity of the kerf. (see generally column 3, lines 29 through 45) This water introduction is required by the disclosure and enablement, as well as being an element in every claim.

Fein '898 states that:

"the addition of water to the plasma jet **44** increases the material flow therein, so that the plasma jet **44** is lengthened, strengthened, and stabilized. In connection with a cutting application, additional mass is thus provided that moves at high velocity and serves to drive molten metal from the cut. The acceleration of this added mass serves, upon contact between the jet and the metal to be cut, to transfer the available energy more effectively into the work. Thus, while the addition of water may be important for other reasons, it is especially helpful in the use of a plasma jet to cut a thick section, such as about 1 inch or more, of a difficult-to-cut material, such as stainless steel or high-speed tool steel or a heat-resistant superalloy of the nickel-base or cobalt-nickel-base type." (Column 3, lines 46 through 58)

Fein '898 requires the introduction of water, which is absent from the present invention. Kelkar et al. '833 requires a nozzle design in which these two gases are commingled, and a nozzle design in which the two exiting gas streams do not converge until well beyond the nozzle tip itself, which features are absent from the present invention. One of ordinary skill in the art would find no motivation to combine these two very different plasma jet designs.

Hence, it is believed that the basis of rejection deserves reconsideration and is respectfully traversed.

Claims 14 – 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kelkar et al '833 in view of Fein '898 as applied above, and further in view of Gourlaouen et al. '687. Applicants respectfully submit that the present invention is not unpatentable over Kelkar et al '833 in view of Fein '898 as applied above, and further in view of Gourlaouen et al. '687.

As discussed above, Fein '898 requires the introduction of water, which is absent from the present invention. Kelkar et al. '833 requires a nozzle design in which these two gases are commingled, and a nozzle design in which the two exiting gas streams do not converge until well beyond the nozzle tip itself, which features are absent from the present invention.

Gourlaouen et al. '687 discloses a gas mixture for use in a plasma projection process. This is not a plasma torch, but a "thermal treatment process permitting producing a surface coating on an object, a member or the like, said coating being adapted, as the case may be, to fulfill a role as a deposit for anti-wear, anti-corrosion, anti-friction or thermal and/or electrical barrier purposes." (Column 1, lines 19 through 23)

The requirements for plasmagenic gas in a plasma projection device are entirely different from the requirements for plasma or shielding gas in a plasma cutting device. The skilled artisan would find absolutely no motivation to combine Gouraouen et al. '687 with either Fein '898 or Kelkar et al. '833. Therefore, Gouraouen et al. '687 fails to cure any of the aforementioned deficiencies of Fein '898 or Keklar et al. '833.

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Hence, it is believed that the basis of rejection deserves reconsideration and is respectfully traversed.

CONCLUSION

Accordingly, it is believed that the present application now stands in condition for allowance. Early notice to this effect is earnestly solicited. Should the Examiner believe a telephone call would expedite the prosecution of the application, he is invited to call the undersigned attorney at the number listed below.

Respectfully submitted,


Elwood Haynes, Reg. No. 55,254

Date: April 13, 2005

Air Liquide
2700 Post Oak Blvd., Suite 1800
Houston, Texas 77056
Phone: (713) 624-8954
Fax: (713) 624-8950

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Diana Guzman